

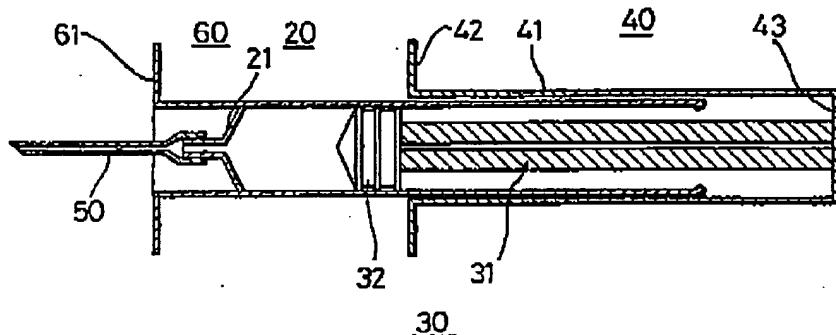
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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: SYRINGE



## (57) Abstract

The syringe (10) according to present invention comprises a syringe barrel (20) disposed a nozzle (21) at one end thereof, a syringe plunger (30) movable with respect to the interior of the syringe barrel (20), a syringe needle (50) mounted to the nozzle (21) of the syringe barrel (20), and a plunger moving member (40) for longitudinally moving the syringe plunger (30) into the syringe barrel (20). The plunger moving member (40) has an end part (43) vertically attached to the outward end of the syringe plunger (30), and a side part (41) elongated along the exterior surface of the syringe barrel (20). The syringe (10) may optionally comprise a securing member (60) having a supporting plate (61) to be supported by the skin of the injection object centering around the needle (50) at injection operation, an insertion length adjusting member for positioning the supporting plate to a desired length starting from the free end of the needle (50), and an injection fluid adjusting member for automatically determining the quantity of the medicine to be injected to the injection object by blocking the downward movement of the plunger moving member (40) at a desired position.

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## SYRINGE

BACKGROUND OF THE INVENTION

## Field of the Invention

5 The present invention is related to a syringe, and particularly to a hypodermic or intermuscular syringe adapted to easily inject a specified quantity of medicine into an injection object which is likely to make abrupt and disruptive movements, for example a baby or an animal.

## 10 Description of the Prior Art

A conventional syringe generally comprises a syringe barrel, a syringe plunger movable with respect to the syringe barrel, and a syringe needle mounted to a nozzle disposed at one end of the syringe barrel. The syringe plunger also 15 includes a plunger head disposed at one end thereof and generally made of rubber, etc., an elongated stem disposed in the middle thereof, and a handle attached to the other end thereof.

In the conventional syringe described above, the operator 20 fills the syringe barrel with a dose of injection fluid by drawing up the injection fluid through the needle. The operator then inserts the needle into the muscle of the injection object and injects the medicine by pushing the plunger handle down.

However, in the conventional syringe, there are many 25 problems in that the syringe needle may be bent or broken by the abrupt movement of the injection object, for example, a baby or an animal, in that injection operation is not easy, and in that it takes a long time to perform the injection.

SUMMARY OF THE INVENTION

30 It is an object of the present invention to provide a

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syringe to facilitate the injection procedure on an object which is likely to make abrupt and disruptive movements.

It is another object of the present invention to provide a syringe for preventing the syringe needle from being bent or 5 broken during the injection procedure.

It is still another object of the present invention to provide a syringe with a means to adjust the length of the syringe needle to be inserted into the muscle of the injection object.

10 It is still another object of the present invention to provide a syringe with a means to adjust the quantity of injection fluid to be injected into the muscle of the injection object.

According to the present invention, the syringe comprises 15 a syringe barrel with a nozzle disposed at one end thereof, a syringe plunger movable with respect to the interior of the syringe barrel, a syringe needle mounted to the nozzle of the syringe barrel, and a plunger moving member for longitudinally moving the syringe plunger within the syringe barrel. The 20 plunger moving member has an end part vertically attached to the outward end of the syringe plunger, and a side part elongated along the exterior surface of the syringe barrel.

In the syringe with the configuration described above, a securing member having a supporting plate centered around the 25 needle, which is supported by the skin of the injection object for the injection procedure is further provided to the syringe barrel adjacent to the nozzle. The securing member is either permanently attached to the syringe barrel or removable from the syringe barrel. The securing member greatly facilitates the

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injection procedure for an injection object which is likely to make abrupt movements.

In the syringe with the configuration described above, a insertion length adjusting member for positioning the 5 supporting plate at a desired distance from the free end of the needle is further provided between the syringe barrel and the securing member. The insertion length adjusting member is preferably thread-coupled to the securing member so that it may longitudinally travel along the length of the needle. 10 Accordingly, the length of the needle to be inserted into the muscle of the injection object may be appropriately adjusted by rotating the insertion length adjusting member.

In the syringe with the configuration described above, an injection fluid adjusting member for automatically determining 15 the quantity of the medicine to be injected into the injection object by blocking the downward movement of the plunger moving member at the desired position is further provided on the syringe barrel. The injection fluid adjusting member is preferably thread-coupled to the exterior surface of the 20 syringe member so that it may travel longitudinally along the syringe barrel.

BRIEF DESCRIPTION OF THE DRAWING

The preferred embodiments of the invention will now be described in detail with reference to the accompanying 25 drawings, in which:

Fig. 1 is a front view of a syringe according to the present invention;

Fig. 2 is a cross-sectional view of the syringe shown in Fig. 1;

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Fig. 3 is a front view of another syringe according to the present invention;

Fig. 4 is a cross-sectional view of the syringe shown in Fig. 3;

5 Fig. 5 is an illustrative view of the manner of using the syringe according to the present invention;

Figs. 6 (A) and (B) are illustrative views of the additional insertion length adjust member according to the present invention; and,

10 Fig. 7 is a front view showing a syringe with an injection fluid adjusting member according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to Figs. 1 and 2, a syringe 10 according to the present invention minimally comprises a cylindrical syringe 15 barrel 20 having a nozzle 21 disposed at one end thereof, a syringe needle 50 mounted to the nozzle 21, a syringe plunger 30 inserted into the syringe barrel 20 and longitudinally travelling in the interior of the syringe barrel 20, and a plunger moving member 40. The syringe plunger 30 has an elongated stem 31 and a plunger head 32 mounted on the inward end of the stem 31. The plunger moving member 40 has an end part 43 vertically attached to the outward end of the stem 31 and a side part 41 elongated along the exterior surface 22 of the syringe barrel 20. An annular stopper 42 is vertically 20 formed at the downward end of the side part 41 of the plunger moving member 40.

When an operator injects medicine into the muscle of the injection object, the plunger moving member 40 makes the removal from the syringe of the injection fluid easy.

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In addition to the configuration described above, a securing member 60 having an annular supporting plate 61 centered around the needle 50, which is supported by the skin of the injection object is provided with unitary the syringe 5 barrel 20. The securing member 60 improves the injection procedure on an injection object which is likely to make an abrupt movements.

In Figs. 3 and 4, a syringe with a securing member modified from that of Figs. 1 and 2 is shown. The securing 10 member 70 shown in Figs. 3 and 4 has a receiving part 72 for receiving the downward end of the syringe barrel 20 in addition to a supporting plate 71 so that it may be separated from the syringe barrel 20.

Referring to Fig. 5, while seizing the plunger moving 15 member 40 of the syringe filled with injection fluid, an operator inserts the needle 50 into the muscle of the injection object 110, and then pushes down the plunger moving member 40 in order to force the injection fluid out of the syringe barrel 20. At this time, the supporting plate 61 and 71 of the 20 securing member 60 and 70 is supported by the skin of the injection object 110 in order to secure the syringe barrel 20, thereby improving the injection procedure on an injection object 110 which is likely to make an abrupt movements.

Figs. 6 (A) and (B) are illustrative views of an 25 additional insertion length adjusting member according to the present invention.

Referring to Figs. 6 (A) and (B), an insertion length adjusting member 80 for positioning the supporting plate 101 at a desired length starting from the free end of the needle

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50 is further provided between the syringe barrel 20 and the securing member 100. The insertion length adjusting member 80 has a receiving part 81 for receiving the downward end of the syringe barrel 20, and a male screw part 82. The securing member 100 has a supporting plate 101, and a female screw part 102 coupled to the male screw part 82.

As the securing member 100 is rotated in a clock-wise or counter clock-wise direction, with respect to the insertion length adjusting member 80, the securing member 100 is moved 10 upward as shown in Fig. 7 (A) or moved downward as shown in Fig. 7 (B) along the insertion length adjusting member 80. Accordingly, an operator may adjust the length of the needle 50 to be inserted into the muscle of the injection object 110 by simply rotating the securing member 100.

15 Fig. 7 is a front view illustrating a syringe with an additional injection fluid adjusting member according to the present invention.

Referring to Fig. 7, an injection fluid adjusting member 90 for automatically determining the quantity of the medicine 20 to be injected into the injection object 110 by blocking the downward movement of the plunger moving member 40 at a desired position is further provided to the syringe barrel 20. The injection fluid adjusting member 90 is a kind of female screw member, which is coupled to a male screw part 23 additionally 25 formed in the exterior surface of the syringe barrel 20, so that it may travel longitudinally along the syringe barrel 20. The injection fluid adjusting member 90 blocks the downward motion of the plunger moving member 40, in other words, the plunger 30, to the desired position for the injection

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procedure, and thereby automatically determining the quantity of the injection fluid.

The syringe having an injection fluid adjusting member 90 may be preferably used in continuous injection operations such as with numerous livestock.

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CLAIMS

1. An improved syringe comprising a syringe barrel with a nozzle disposed at one end thereof, a syringe plunger movable with respect to the interior of the syringe barrel, a syringe 5 needle mounted to the nozzle of the syringe barrel, wherein the improvement comprises a plunger moving member for longitudinally moving the syringe plunger into the syringe barrel, said plunger moving member including an end part vertically attached to the outward end of the syringe plunger, 10 and a side part elongated along the exterior surface of the syringe barrel.

2. An improved syringe according to claim 1, said syringe further comprising a securing member having the supporting plate centered around the needle, which is supported by the 15 skin of an injection object for the injection procedure.

3. An improved syringe according to claim 2, wherein said securing member is a unified part of said syringe member.

4. An improved syringe according to claim 2, wherein said securing member is separable from said syringe member.

20 5. An improved syringe according to claim 4, said syringe further comprising an insertion length adjusting member between said syringe barrel and said securing member, for positioning said supporting plate at a desired distance from the free end of the needle.

25 6. An improved syringe according to claim 5, wherein said insertion length adjusting member is thread-coupled to said securing member, whereby said securing member may be moved longitudinally along said insertion length adjusting member by rotating said securing member.

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7. An improved syringe in any one the preceding claims, said syringe further comprising an injection fluid adjusting member for automatically determining the quantity of injection fluid to be injected into the injection object by blocking the 5 downward movement of said plunger moving member at the desired position.

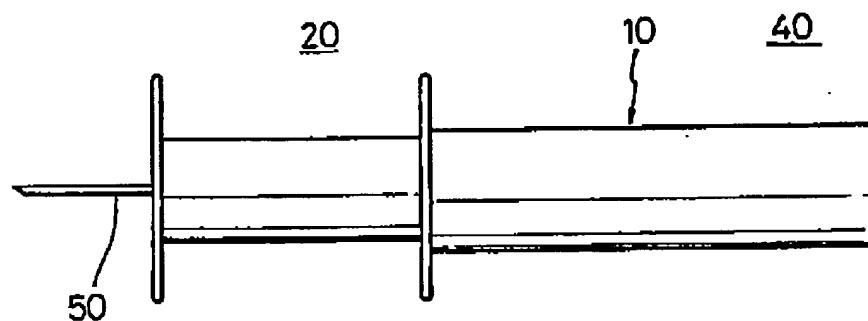
8. An improved syringe according to claim 7, wherein said injection fluid adjusting member is thread-coupled to the exterior surface of the syringe member, whereby said injection 10 fluid adjusting member may be moved longitudinally along the syringe barrel by rotating said injection fluid adjusting member.

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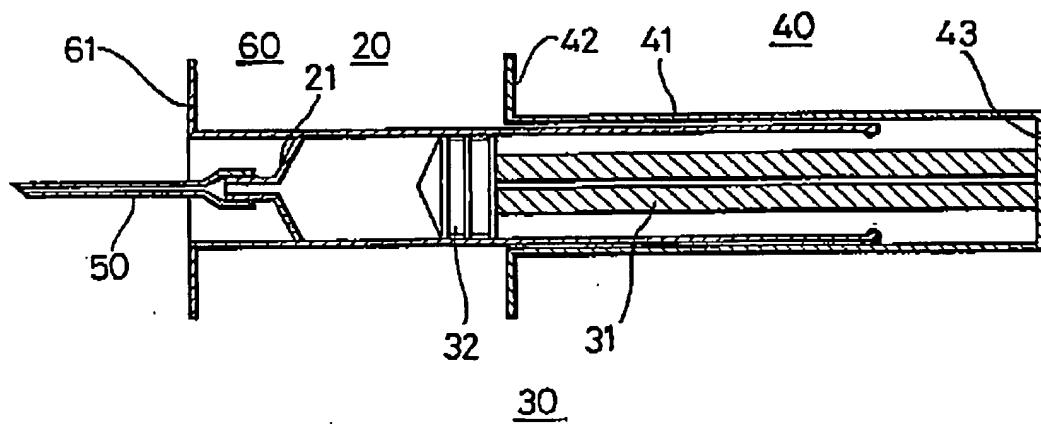
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F I G. 1



F I G. 2

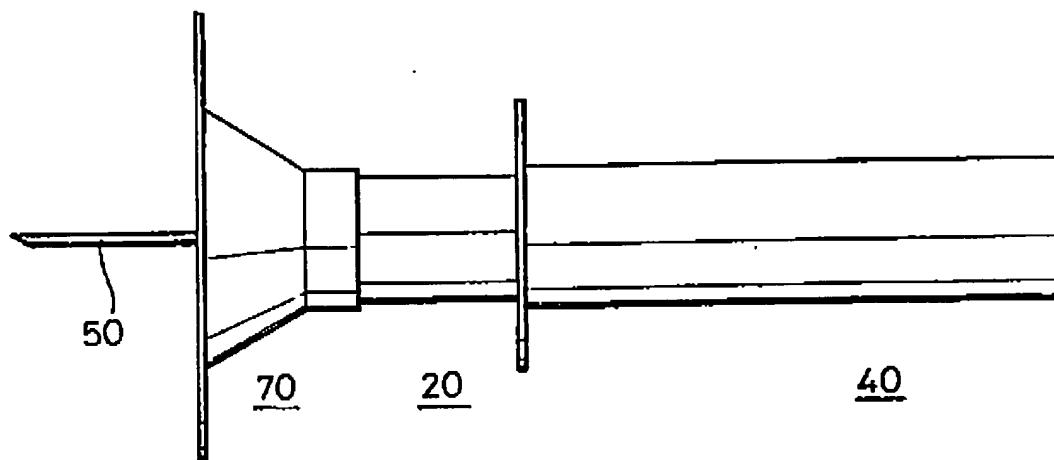


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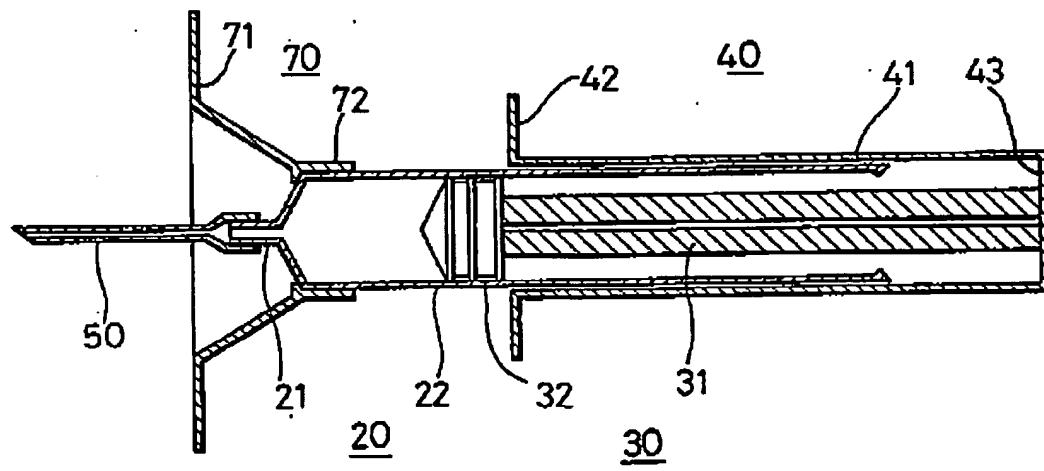
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F I G. 3



F I G. 4

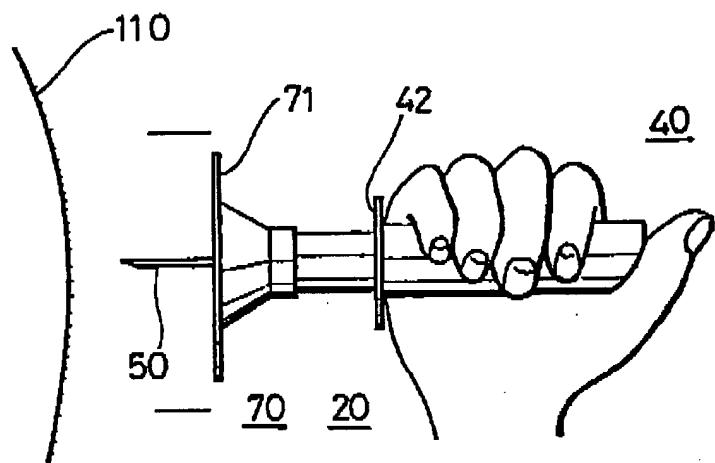


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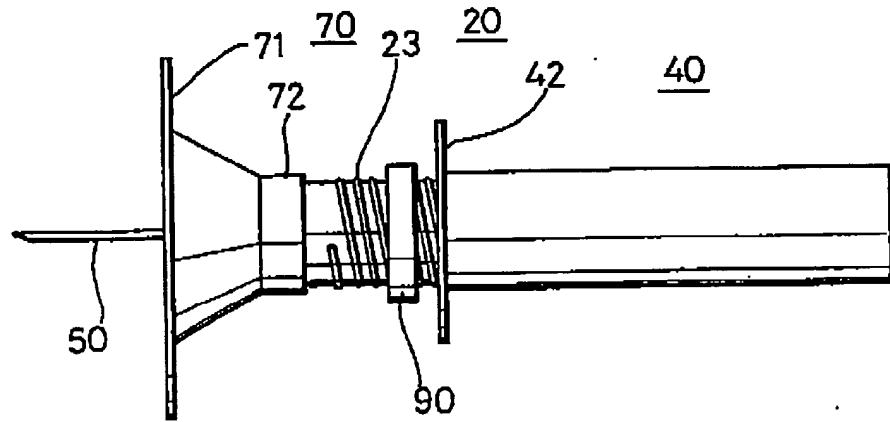
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F I G. 5



F I G. 7

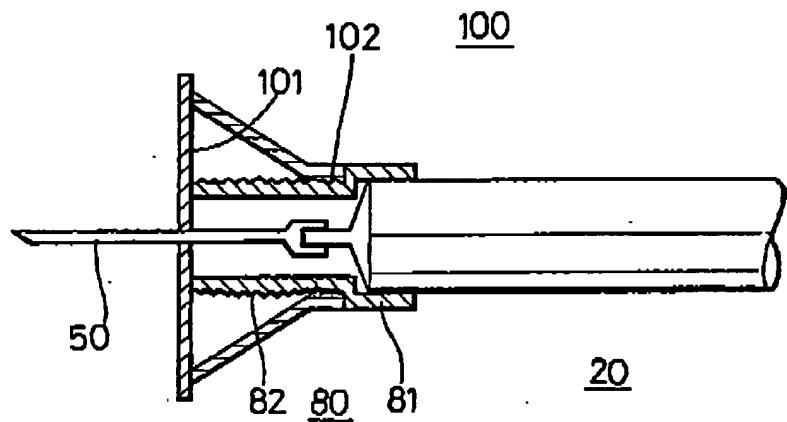


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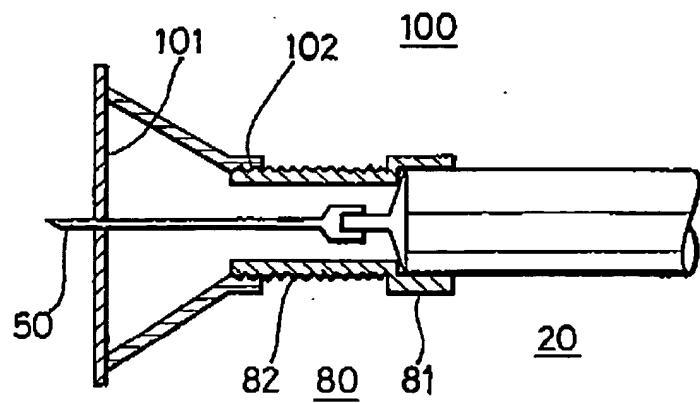
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## F I G. 6A



## F I G. 6B



## INTERNATIONAL SEARCH REPORT

International application No.

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## A. CLASSIFICATION OF SUBJECT MATTER

IPC<sup>6</sup>: A 61 M 5/31, 5/315, 5/32//A 61 M 5/46

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC<sup>6</sup>: A 61 M 5/31, 5/315, 5/32, 5/46

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|--|-----------------------|
| X         | US, A, 4 112 945 (M.I. HELIXON) 12 September 1978 (12.09.78),                      | 1                     |
| Y         | totality; especially figs. 6-8;  | 2,4,5                 |
| A         | column 6, line 31 - column 7, line 17.   | 7                     |
| X         | US, A, 2 860 635 (E.H. WILBURN) 18 November 1958 (18.11.58),                       | 1                     |
| Y         | figs. 1,6-12,23,25; abstract.  | 2,4,5                 |
| X         | GB, A, 2 003 037 (MED. SCIENCES INT.) 07 March 1979 (07.03.79),                    | 1                     |
| Y         | totality.  | 2,4,5                 |
| X         | US, A, 4 639 248 (J.D. SCHWEBLIN) 27 January 1987 (27.01.87),                      | 1                     |
| Y         | totality.  | 2,4,5                 |
| Y         | US, A, 4 356 822 (D. WINSTEAD-HALL) 02 November 1982 (02.11.82),                   | 2,4,5                 |
| A         | totality; especially column 4, lines 35-42; column 4, line 64 - column 5, line 2.  | 6                     |

Further documents are listed in the continuation of Box C.  See patent family annex.

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| Date of the actual completion of the international search<br>05 October 1994 (05.10.94) | Date of mailing of the international search report<br>10 October 1994 (10.10.94) |
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| Name and mailing address of the ISA/AT<br>AUSTRIAN PATENT OFFICE<br>Kohlmarkt 8-10<br>A-1014 Vienna<br>Facsimile No. 1/53424/535 | Authorized officer<br>Ludwig e.h.<br>Telephone No. 1/53424/349 |
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**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

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| US A 4112945  | 12-09-78   | US A 4091812  | 30-05-78   |
| US A 2860635  |  | keine - none - rien   |  |
| BB A1 2003037   | 07-03-79   | CH A 627941<br>DE A1 2836880<br>FR A1 2401666<br>FR B1 2401666<br>GB B2 2003037<br>JP A2 54052890<br>JP B4 62006821<br>US A 4148316 | 15-02-82<br>22-03-79<br>30-03-79<br>20-04-84<br>20-10-82<br>25-04-79<br>13-02-87<br>10-04-79 |
| US A 4639248  | 27-01-87   | AT E 52700<br>CH A 660972<br>DE CQ 3577460<br>EP A1 186232<br>EP B1 186232<br>JP A2 61137566<br>CH A 661444                         | 15-06-90<br>30-06-87<br>21-06-90<br>02-07-86<br>16-05-90<br>25-06-86<br>31-07-87             |
| US A 4356822  | 02-11-82   | keine - none - rien   |  |